

6-1

NAME _____ DATE _____

Slope (Pages 325–331)

Definition of Slope	The steepness of a line in the coordinate plane is called its slope . It is defined as the ratio of the rise , or vertical change in y , to the run , or horizontal change as you move from one point to the other.
Determining Slope Given Two Points	Given the coordinates of two points, (x_1, y_1) and (x_2, y_2) , on a line, the slope m of the line can be found as follows. $m = \frac{y_2 - y_1}{x_2 - x_1}, \text{ where } x_1 \neq x_2$

EXAMPLES

- A** What is the slope of the line that passes through $(4, -6)$ and $(-2, 3)$?

Let $x_1 = 4$, $y_1 = -6$, $x_2 = -2$, and $y_2 = 3$.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{3 - (-6)}{-2 - 4}$$

$$m = \frac{9}{-6} \text{ or } -\frac{3}{2}$$

- B** Find the value of r so that the line through $(r, 4)$ and $(0, 5)$ has a slope of -2 .

$$-2 = \frac{5 - 4}{0 - r} \quad \text{Slope formula with } m = -2, \\ (x_1, y_1) = (r, 4), \text{ and } (x_2, y_2) = (0, 5)$$

$$\frac{-2}{1} = \frac{1}{-r}$$

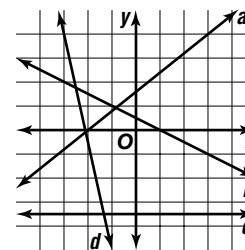
$$2r = 1 \quad \text{Find the cross products.}$$

$$r = \frac{1}{2} \quad \text{Solve for } r.$$

PRACTICE

Determine the slope of each line using the graph at the right.

- line a
- line b
- line c
- line d



Determine the slope of the line that passes through each pair of points.

- $(9, 3), (7, 6)$
- $(-3, -2), (9, -5)$
- $(\frac{1}{3}, -1\frac{1}{3}), (2\frac{1}{3}, \frac{1}{3})$

Determine the value of r so the line that passes through each pair of points has the given slope.

- $(3, r), (5, -9), m = \frac{9}{2}$
- $(0, -8), (r, 0), m = -\frac{2}{5}$
- $(5, -4), (6, r), m = 2$

- 11. Construction** Ann is building a wheelchair ramp with a 7% incline from her entryway into her sunken living room. The height of the ramp needs to be 21 cm. What will be the length of the ramp?



- 12. Standardized Test Practice** What is the slope of the line that passes through $(1, -3)$ and $(-2, 6)$?

- A** -3 **B** -1 **C** 1 **D** 3

Answers: 1. $\frac{5}{4}$ 2. $-\frac{5}{4}$ 3. 0 4. $-\frac{9}{2}$ 5. $-\frac{2}{9}$ 6. $-\frac{2}{3}$ 7. $-\frac{4}{1}$ 8. $\frac{6}{5}$ 9. -18 10. -20 11. 300 cm or 3 m 12. A